

OPEN SYSTEMS POLICY HIGHLIGHTS

I. Introduction

The purpose of this document is to provide readers with a quick reference and better understanding of scope and content of open system policy language in the DoD 5000 series documents. These policy directions have been promulgated in May 12, 2003 revision of the DoD Directive 5000.1, the DoD Instruction 5000.2 “Operation of the Defense Acquisition System,” and the subsequent canceling of the DoD 5000.2-R, “Mandatory Procedures for Major Defense Acquisition Programs and Major Automated Information Systems Acquisition Programs” and its conversion into the Interim Defense Acquisition Guidebook (October 30, 2002).

The new streamlined policy language in the DODD 5000.1 enables decision-makers and program managers to tailor acquisition strategies to fit the particular conditions of an individual program. It also makes time-phased requirements and evolutionary acquisition strategies the preferred approach to establishing and documenting operational needs. Moreover, proposed programs may enter the acquisition process at various decision points, depending on concept and technology maturity. The decision-makers, users, and program managers are also required to first consider the procurement of commercially available products, services, and technologies, or the development of dual-use technologies, to satisfy user requirements.

The DoD Instruction 5000.2 is a new policy document that establishes a simplified and flexible management framework for translating mission needs and technological opportunities into stable, affordable, and well-managed acquisition programs. It also establishes a general approach for managing acquisition programs while acknowledging that every technology project and acquisition program is unique and that any particular project or program, particularly non-major programs, need not follow the entire acquisition process. Based on the new DoD Instruction, the Defense Acquisition System is a continuum composed of following three activities with multiple paths into and out of each activity:

- Pre-system acquisition - Technologies are researched, developed, or procured in pre-system acquisition (science and technology and concept development and demonstration).
- Systems acquisition - Systems are developed, demonstrated, produced or procured, and deployed in systems acquisition.
- Post-systems acquisition - Once deployed, the system is supported throughout its operational life and eventual disposal in post-systems acquisition.

The Interim Defense Acquisition Guidebook is being completely revised and the current Interim Guidebook is identical to the cancelled DoD 5000.2-R; the “Mandatory Procedures for Major Defense Acquisition Programs and Major Automated Information Systems Acquisition Programs.” The guidance directions contained in the Guidebook is compatible with the newly approved acquisition process and instructions. The interim Guidebook will provide the acquisition workforce with the best information available to implement the Directive and Instruction guidance

II. Specific Directions

The Open Systems Joint Task Force Task force has been able to insert new language and improve the existing open systems guidance contained in DoDD 5000.1 and the Interim Defense Guidebook documents.

A. Open System Language in the DoDD 5000.1 (approved May 12, 2003)

Based on the new open systems policy guidance, the programs are directed to use a modular open system approach (MOSA) to ensure access to the latest technologies and products, and facilitate affordable and supportable modernization of fielded assets. Paragraph E1.27 titled "Systems Engineering" contain open systems related guidance for acquisition decision makers. It reads as:

"Acquisition programs shall be managed through the application of a systems engineering approach that optimizes total system performance and minimizes total ownership costs. A modular, open-systems approach shall be employed, where feasible."

The following paragraphs contain policy language that indirectly calls for the application of MOSA and will most cost effectively be implemented using such approach:

- Paragraph 4.3.2 Responsiveness. Advanced technology shall be integrated into producible systems and deployed in the shortest time practicable. Approved, time-phased capability needs matched with available technology and resources enable evolutionary acquisition strategies. Evolutionary acquisition strategies are the preferred approach to satisfying operational needs. Spiral development is the preferred process for executing such strategies.
- Paragraph E1.3 Competition. ... Acquisition managers shall take all necessary actions to promote a competitive environment, including the consideration of alternative systems to meet stated mission needs; structuring S&T investments and acquisition strategies to ensure the availability of competitive suppliers throughout a program's life, and for future programs; ensuring that prime contractors foster effective competition for major and critical products and technologies;
- Paragraph E1.13 Interoperability. Systems, units, and forces shall be able to provide and accept data, information, materiel, and services to and from other systems, units, and forces and shall effectively interoperate with other U.S. Forces and coalition partners. Joint concepts and integrated architectures shall be used to characterize these interrelationships.
- Paragraph E1.14 Knowledge-Based Acquisition.PMs shall reduce technology risk, demonstrate technologies in a relevant environment, and identify technology alternatives, prior to program initiation. They shall reduce integration risk and demonstrate product design prior to the design readiness review. They shall reduce manufacturing risk and demonstrate producibility prior to full-rate production.

- Paragraph E1.16 Performance-Based Acquisition. To maximize competition, innovation, and interoperability, and to enable greater flexibility in capitalizing on commercial technologies to reduce costs, acquisition managers shall consider and use performance-based strategies for acquiring and sustaining products and services whenever feasible. For products, this includes all new procurements and major modifications and upgrades, as well as reprocurements of systems, subsystems, and spares that are procured beyond the initial production contract award. When using performance-based strategies, contract requirements shall be stated in performance terms, limiting the use of military specifications and standards to Government-unique requirements only.
- Paragraph E1.18 Products, Services, and Technologies. The DoD Component(s) shall consider multiple concepts and analyze possible alternative ways to satisfy the user need. System concepts shall be founded in an operational context, consistent with the National Military Security Strategy, Defense Planning Guidance, Joint Concepts, and joint integrated architectures. The DoD Components shall seek the most cost-effective solution over the system's life cycle. They shall conduct market research and analysis to determine the availability, suitability, operational supportability, interoperability, safety, and ease of integration of the considered and selected procurement solutions. The DoD Components shall work with users to define capability needs that facilitate the following, listed in descending order of preference:
 - E1.18.1 The procurement or modification of commercially available products, services, and technologies, from domestic or international sources, or the development of dual-use technologies...

B. Open System Language in the DoDI 5000.2 (approved May 12, 2003)

There is no direct and specific reference to open systems policy guidance in the Instruction. However, the indirect language requires that programs refrain from early commitments to system-specific solutions that inhibit future insertion of new technology and commercial or non-developmental items. The following paragraphs in the DoDI 5000.2 contain indirect open systems related guidance for acquisition decision-makers:

- Section 3.2.1 Integrated Architectures, Paragraph 3.2.1.2 Military Departments and Defense Agencies shall participate in the identification of the appropriate technical view consisting of standards that define and clarify the individual systems technology and integration requirements.
- Paragraph 3.3.5. The ICD and the AoA plan shall guide Concept Refinement. The focus of the AoA is to refine the selected concept documented in the approved ICD. The AoA shall assess the critical technologies associated with these concepts, including technology maturity, technical risk, and, if necessary, technology maturation and demonstration needs. To achieve the best possible system solution, emphasis shall be placed on innovation and competition. Existing commercial-

off-the-shelf (COTS) functionality and solutions drawn from a diversified range of large and small businesses shall be considered.

C. Open System Language in the Interim Defense Acquisition Guidebook (approved October 30, 2002)

As mentioned earlier, the open system policy language in the interim Defense Acquisition Guidebook document is the same language that was contained in the cancelled DoD 5000.2-R. The open systems language contained in this document guides the PMs to assess the feasibility of using widely-supported commercial interface standards in developing systems. PMs are also encouraged to report on their progress using open standards for key interfaces at both Milestones B and C. Program managers should also identify key interfaces and define the system level (system-of-systems, system, subsystem, or component) at and above which these interfaces use various types of standards. The new guidance also stipulates that the selected Commercial Items (CIs) and Non Developmental Items (NDIs) have open interfaces to the maximum extent practicable and the risks and impacts on total cost of ownership be evaluated if products with closed interfaces are acquired. The following paragraphs in the Interim Defense Acquisition Guidebook contain open systems related guidance for acquisition decision-makers:

- Part 2: Acquisition Strategy, Paragraph 2.7.1 titled “Open Systems”

The new open systems guidance at this paragraph encourage PMs to assess the feasibility of using widely-supported commercial interface standards in developing systems. It also guides PMs to make the open systems approach an integral part of the overall acquisition strategy to enable rapid acquisition with demonstrated technology, evolutionary and conventional development, interoperability, life-cycle supportability, and incremental system upgradeability without major redesign during initial procurement and reprocurement of systems, subsystems, components, spares, and services, and during post-production support. PMs are also encouraged to document their approach for using open systems and include a summary of their approach as part of their overall acquisition strategy.

- Part 5: Program Design, Paragraph 5.2.5, titled "Open Systems Design"

The open systems guidance in this paragraph directs PMs to use a modular, standards-based architecture in design of weapons systems. PMs should identify key interfaces and define the system level (system of system, system, subsystem, or component) at and above which these interfaces use various types of standards. The language also directs PMs to use open interface standards first, then de facto, and finally government and proprietary interface standards. PMs are also encouraged to report on their progress using open standards for key interfaces at both Milestones B and C. Based on the new open systems acquisition policy guidance, PMs may use an open systems approach to achieve the following objectives:

- To adapt to evolving requirements and threats;
- To accelerate transition from science and technology into acquisition and deployment;

- To enhance modularity and facilitate systems integration;
 - To leverage commercial investment in new technologies and products;
 - To reduce the development cycle time and total life-cycle cost;
 - To ensure the system is fully interoperable with all systems with which it must interface, without major modification of existing components;
 - To achieve commonality and reuse of components among systems;
 - To provide users the ability to quickly and affordably interconnect and assemble existing platforms, systems, subsystems, and components as needed;
 - To maintain continued access to cutting edge technologies and products from multiple suppliers during initial procurement, reprocurement, and post-production support;
 - To mitigate the risks associated with technology obsolescence, being locked into proprietary technology, and reliance on a single source of supply over the life of a system;
 - To conduct business case analyses to justify decisions to enhance life-cycle supportability and continuously improve product affordability through technology insertion during initial procurement, reprocurement, and post-production support; and
 - To facilitate modular contracting.
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- Part 5: Program Design, Paragraph 5.2 titled “Systems Engineering”

The open systems guidance language under this paragraph calls for application of a systems engineering process that will ensure the interoperability and integration of all operational, functional, and physical interfaces. It stipulates that iterative requirements analyses accompany functional analysis/allocation to develop and refine system-level functional and performance requirements and external interfaces to facilitate the design of open systems. The design solutions are also required to be sufficiently detailed to verify that open system performance requirements have been met. The iterative functional analyses/allocations must also define successively lower-level functional and performance requirements, including functional interfaces and architecture to achieve open systems and facilitate the use of a performance-based business environment. The open systems policy language at this paragraph also stipulates that system analysis and control activities include a configuration management process to facilitate the development of open systems. The overall risk management effort must also include technology transition planning and establish transition criteria and interface controls to ensure all internal and external interface requirements changes are properly recorded and communicated to all affected configuration items.
 - Other Open Systems Policy Guidance at the Interim Defense Acquisition Guidebook

Beside guidance language in the above-mentioned paragraphs, open systems guidance has also been inserted in the following paragraphs:

 - Part 2: Acquisition Strategy
 - Paragraph 2.6.3, Integrated Digital Environment (IDE)

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- Paragraph 2.6.6.2, Applying Best Practices
- Paragraph 2.7.2, Interoperability
- Paragraph 2.8, Support Strategy
- Paragraph 2.8.1.1, Product Support Management Plan
- Paragraph 2.8.6, Life-Cycle Support Oversight
- Paragraph 2.9.1.2.2, Applying Competition to Evolutionary Acquisition
- Paragraph 2.9.1.3.2, Sub-Tier Competition
- Paragraph 2.9.1.4.1, Market Research
- Paragraph 2.9.1.4.2, Commercial and Non-Develop-mental Items
- Paragraph 2.9.1.4.3, Dual-Use Technologies and the Use of Commercial Plants
- Part 5: Program Design
 - Paragraph 5.2.6, Software Management
 - Paragraph 5.2.7, COTS Considerations
 - Paragraph 5.3.2, Performance Specifications